IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Please add new claims 80-87

Please amend claims 30, 32, 33, and 35.

Please cancel claim 34 without prejudice.

STATUS OF CLAIMS

Claim 1 **(withdrawn):** An isolated nucleic acid molecule comprising a nucleotide sequence that encodes a polypeptide comprising an amino acid sequence homologous to a sequence of SEQ ID NO:2; said nucleic acid molecule encoding at least a portion of nGPCR-2644.

Claim 2 **(withdrawn):** The isolated nucleic acid molecule of claim 1 comprising a sequence that encodes a polypeptide comprising a sequence of SEQ ID NO:2.

Claim 3 **(withdrawn):** The isolated nucleic acid molecule of claim 1 comprising a sequence homologous to a sequence of SEQ ID NO:1.

Claim 4 **(withdrawn):** The isolated nucleic acid molecule of claim 1 comprising a sequence of SEQ ID NO:1.

Claim 5 **(withdrawn):** The isolated nucleic acid molecule of claim 1 wherein said nucleic acid molecule is DNA.

Claim 6 **(withdrawn):** The isolated nucleic acid molecule of claim 1 wherein said nucleic acid molecule is RNA.

Claim 7 **(withdrawn):** An expression vector comprising a nucleic acid molecule of any one of claims 1 to 4.

Claim 8 **(withdrawn):** The expression vector of claim 7 wherein said nucleic acid molecule comprises a sequence of SEQ ID NO:1.

Claim 9 **(withdrawn):** The expression vector of claim 7 wherein said vector is a plasmid.

Claim 10 **(withdrawn):** The expression vector of claim 7 wherein said vector is a viral particle.

Claim 11 **(withdrawn):** The expression vector of claim 10 wherein said vector is selected from the group consisting of adenoviruses, baculoviruses, parvoviruses, herpesviruses, poxviruses, adeno-associated viruses, Semliki Forest viruses, vaccinia viruses, and retroviruses.

Claim 12 **(withdrawn):** The expression vector of claim 7 wherein said nucleic acid molecule is operably connected to a promoter selected from the group consisting of simian virus 40, mouse mammary tumor virus, long terminal repeat of human immunodeficiency virus, maloney virus, cytomegalovirus immediate early promoter, Epstein Barr virus, rous sarcoma virus, human actin, human myosin, human hemoglobin, human muscle creatine, and human metalothionein.

Claim 13 **(withdrawn):** A host cell transformed with an expression vector of claim 7.

Claim 14 **(withdrawn):** The transformed host cell of claim 13 wherein said cell is a bacterial cell.

Claim 15 **(withdrawn):** The transformed host cell of claim 14 wherein said bacterial cell is E. coli.

Claim 16 **(withdrawn):** The transformed host cell of claim 13 wherein said cell is yeast.

Claim 17 **(withdrawn):** The transformed host cell of claim 16 wherein said yeast is S. cerevisiae.

Claim 18 **(withdrawn):** The transformed host cell of claim 13 wherein said cell is an insect cell.

Claim 19 **(withdrawn):** The transformed host cell of claim 18 wherein said insect cell is S. frugiperda.

Claim 20 **(withdrawn):** The transformed host cell of claim 13 wherein said cell is a mammalian cell.

Claim 21 **(withdrawn):** The transformed host cell of claim 20 wherein mammalian cell is selected from the group consisting of chinese hamster ovary cells, HeLa cells, African green monkey kidney cells, human HEK-293 cells, and murine 3T3 fibroblasts.

Claim 22 **(withdrawn):** An isolated nucleic acid molecule comprising at least 10 nucleotides, said nucleic acid molecule comprising a nucleotide sequence complementary to at least a portion of a sequence of SEQ ID NO:1.

Claim 23 **(withdrawn):** The nucleic acid molecule of claim 22 wherein said molecule is an antisense oligonucleotide directed to a region of a sequence of SEQ ID NO:1.

Claim 24 **(withdrawn):** The nucleic acid molecule of claim 23 wherein said oligonucleotide is directed to a regulatory region of a sequence of SEQ ID NO:1.

Claim 25 **(withdrawn):** A composition comprising a nucleic acid molecule of any one of claims 1 to 4 or 22 and an acceptable carrier or diluent.

Claim 26 **(withdrawn):** A composition comprising a recombinant expression vector of claim 7 and an acceptable carrier or diluent.

Claim 27 **(withdrawn):** A method of producing a polypeptide that comprises a sequence of SEQ ID NO:2, and homologs thereof, said method comprising the steps of:

a) introducing a recombinant expression vector of claim 8 into a compatible host cell;

b) growing said host cell under conditions for expression of said polypeptide; and

c) recovering said polypeptide.

Claim 28 **(withdrawn):** The method of claim 27 wherein said host cell is lysed and said polypeptide is recovered from the lysate of said host cell.

Claim 29 **(withdrawn):** The method of claim 27 wherein said polypeptide is recovered by purifying the culture medium without lysing said host cell.

Claim 30 **(currently amended):** An isolated polypeptide ~~encoded by a nucleic acid molecule of claim 1~~, comprising SEQ ID NO:2 or a fragment thereof, wherein said polypeptide comprises an epitope specific to SEQ ID NO: 2.

Claim 31 **(original):** The polypeptide of claim 30 wherein said polypeptide comprises a sequence of SEQ ID NO:2.

Claim 32 **(currently amended):** The polypeptide of claim 33 ~~30~~ wherein said polypeptide comprises an amino acid sequence with at least 95% sequence identity to a sequence of SEQ ID NO:2.

Claim 33 **(currently amended)** An isolated ~~The~~ polypeptide comprising an amino acid sequence at least 80% homologous to SEQ ID NO: 2. ~~sequence homologous to a sequence of SEQ ID NO:2 comprises at least one conservative amino acid substitution compared to the sequence of SEQ ID NO:2.~~

Claim 34 **(canceled)**

Claim 35 **(currently amended):** A composition comprising a polypeptide of claim 30 ~~34~~ and an acceptable carrier or diluent.

Claim 36 **(withdrawn):** An isolated antibody which binds to an epitope on a polypeptide of claim 30.

Claim 37 **(withdrawn):** The antibody of claim 36 wherein said antibody is a monoclonal antibody.

Claim 38 **(withdrawn):** A composition comprising an antibody of claim 36 and an acceptable carrier or diluent.

Claim 39 **(withdrawn):** A method of inducing an immune response in a mammal against a polypeptide of claim 30 comprising administering to said mammal an amount of said polypeptide sufficient to induce said immune response.

Claim 40 **(withdrawn):** A method for identifying a compound which binds nGPCR-2644 comprising the steps of:

a) contacting nGPCR-2644 with a compound; and

b) determining whether said compound binds nGPCR-2644.

Claim 41 **(withdrawn):** The method of claim 40 wherein the nGPCR-2644 comprises an amino acid sequence of SEQ ID NO:2.

Claim 42 **(withdrawn):** The method of claim 40 wherein binding of said compound to nGPCR-2644 is determined by a protein binding assay.

Claim 43 **(withdrawn):** The method of claim 40 wherein said protein binding assay is selected from the group consisting of a gel-shift assay, Western blot, radiolabeled competition assay, phage-based expression cloning, co-fractionation by chromatography, co-precipitation, cross linking, interaction trap/two-hybrid analysis, southwestern analysis, and ELISA.

Claim 44 **(withdrawn):** A compound identified by the method of claim 40.

Claim 45 **(withdrawn):** A method for identifying a compound which binds a nucleic acid molecule encoding nGPCR-2644 comprising the steps of:

a) contacting said nucleic acid molecule encoding nGPCR-2644 with a compound; and

b) determining whether said compound binds said nucleic acid molecule.

Claim 46 **(withdrawn):** The method of claim 45 wherein binding is determined by a gel-shift assay.

Claim 47 **(withdrawn):** A compound identified by the method of claim 45.

Claim 48 **(withdrawn):** A method for identifying a compound which modulates the activity of nGPCR-2644 comprising the steps of:

a) contacting nGPCR-2644 with a compound; and

b) determining whether nGPCR-2644 activity has been modulated.

Claim 49 **(withdrawn):** The method of claim 48 wherein the nGPCR-2644 comprises an amino acid sequence of SEQ ID NO:2.

Claim 50 **(withdrawn):** The method of claim 48 wherein said activity is neuropeptide binding.

Claim 51 **(withdrawn):** The method of claim 48 wherein said activity is neuropeptide signaling.

Claim 52 **(withdrawn):** A compound identified by the method of claim 48.

Claim 53 **(withdrawn):** A method of identifying an animal homolog of nGPCR-2644 comprising the steps:

a) comparing the nucleic acid sequences of the animal with a sequence of SEQ ID NO:1, and portions thereof, said portions being at least 10 nucleotides; and

b) identifying nucleic acid sequences of the animal that are homologous to said sequence of SEQ ID NO:1, and portions thereof, said portions comprising at least 10 nucleotides.

Claim 54 **(withdrawn):** The method of claim 53 wherein comparing the nucleic acid sequences of the animal with a sequence of SEQ ID NO:1, and portions thereof, said portions being at least 10 nucleotides, is performed by DNA hybridization.

Claim 55 **(withdrawn):** The method of claim 53 wherein comparing the nucleic acid sequences of the animal with a sequence of SEQ ID NO:1, and portions thereof, said portions being at least 10 nucleotides, is performed by computer homology search.

Claim 56 **(withdrawn):** A method of screening a human subject to diagnose a disorder affecting the brain or genetic predisposition therefor, comprising the steps of:

(a) assaying nucleic acid of a human subject to determine a presence or an absence of a mutation altering an amino acid sequence, expression, or biological activity of at least one nGPCR-2644 that is expressed in the brain, wherein the nGPCR-2644 comprises an amino acid sequence of SEQ ID NO:2, and allelic variants thereof, and wherein the nucleic acid corresponds to a gene encoding the nGPCR-2644; and

(b) diagnosing the disorder or predisposition from the presence or absence of said mutation, wherein the presence of a mutation altering the amino acid sequence, expression, or biological activity of the nGPCR-2644 in the nucleic acid correlates with an increased risk of developing the disorder.

Claim 57 **(withdrawn):** A method according to claim 56, wherein the disease is a mental disorder.

Claim 58 **(withdrawn):** A method according to claim 56, wherein the assaying step comprises at least one procedure selected from the group consisting of:

a) comparing nucleotide sequences from the human subject and reference sequences and determining a difference of at least a nucleotide of at least one codon between the nucleotide sequences from the human subject that encodes a nGPCR-2644 reference sequence;

(b) performing a hybridization assay to determine whether nucleic acid from the human subject has a nucleotide sequence identical to or different from one or more reference sequences;

(c) performing a polynucleotide migration assay to determine whether nucleic acid from the human subject has a nucleotide sequence identical to or different from one or more reference sequences; and

(d) performing a restriction endonuclease digestion to determine whether nucleic acid from the human subject has a nucleotide sequence identical to or different from one or more reference sequences.

Claim 59 **(withdrawn):** A method according to claim 58 wherein the assaying step comprises: performing a polymerase chain reaction assay to amplify nucleic acid comprising nGPCR-2644 coding sequence, and determining nucleotide sequence of the amplified nucleic acid.

Claim 60 **(withdrawn):** A method of screening for an nGPCR-2644 hereditary mental disorder genotype in a human patient, comprising the steps of:

(a) providing a biological sample comprising nucleic acid from said patient, said nucleic acid including sequences corresponding to alleles of nGPCR-2644; and

(b) detecting the presence of one or more mutations in the nGPCR-2644 allele;

wherein the presence of a mutation in a nGPCR-2644 allele is indicative of a hereditary mental disorder genotype.

Claim 61 **(withdrawn):** The method according to claim 60 wherein said biological sample is a cell sample.

Claim 62 **(withdrawn):** The method according to claim 60 wherein said detecting the presence of a mutation comprises sequencing at least a portion of said nucleic acid, said portion comprising at least one codon of said nGPCR-2644 allele, said portion comprising at least 10 nucleotides.

Claim 63 **(withdrawn):** The method according to claim 60 wherein said nucleic acid is DNA.

Claim 64 **(withdrawn):** The method according to claim 60 wherein said nucleic acid is RNA.

Claim 65 **(withdrawn):** A kit for screening a human subject to diagnose a mental disorder or a genetic predisposition therefor, comprising, in association:

(a) an oligonucleotide useful as a probe for identifying polymorphisms in a human nGPCR-2644 gene, the oligonucleotide comprising 6-50 nucleotides in a sequence that is identical or complementary to a sequence of a wild type human nGPCR-2644 gene sequence or nGPCR-2644 coding sequence, except for one sequence difference selected from the group consisting of a nucleotide addition, a nucleotide deletion, or nucleotide substitution; and

(b) a media packaged with the oligonucleotide, said media containing information for identifying polymorphisms that correlate with mental disorder or a genetic predisposition therefor, the polymorphisms being identifiable using the oligonucleotide as a probe.

Claim 66 **(withdrawn):** A method of identifying a nGPCR-2644 allelic variant that correlates with a mental disorder, comprising the steps of:

(a) providing a biological sample comprising nucleic acid from a human patient diagnosed with a mental disorder, or from the patient's genetic progenitors or progeny;

(b) detecting in the nucleic acid the presence of one or more mutations in an nGPCR-2644 that is expressed in the brain, wherein the nGPCR-2644 comprises an amino acid sequence of SEQ ID NO:2, and allelic variants thereof, and wherein the nucleic acid includes sequence corresponding to the gene or genes encoding nGPCR-2644;

wherein the one or more mutations detected indicates an allelic variant that correlates with a mental disorder.

Claim 67 **(withdrawn):** A purified and isolated polynucleotide comprising a nucleotide sequence encoding a nGPCR-2644 allelic variant identified according to claim 66.

Claim 68 **(withdrawn):** A host cell transformed or transfected with a polynucleotide according to claim 67 or with a vector comprising the polynucleotide.

Claim 69 **(withdrawn):** A purified polynucleotide comprising a nucleotide sequence encoding nGPCR-2644 of a human with a mental disorder;

wherein said polynucleotide hybridizes to the complement of a sequence of SEQ ID NO:1 under the following hybridization conditions:

(a) hybridization for 16 hours at 42°C in a hybridization solution comprising 50% formamide, 1% SDS, 1 M NaCl, 10% dextran sulfate and

(b) washing 2 times for 30 minutes at 60°C in a wash solution comprising 0.1x SSC and 1% SDS; and

wherein the polynucleotide that encodes nGPCR-2644 amino acid sequence of the human differs from the sequence of SEQ ID NO:1 by at least one residue.

Claim 70 **(withdrawn):** A vector comprising a polynucleotide according to claim 69.

Claim 71 **(withdrawn):** A host cell that has been transformed or transfected with a polynucleotide according to claim 69 and that expresses the nGPCR-2644 protein encoded by the polynucleotide.

Claim 72 **(withdrawn):** A host cell according to claim 71 that has been co-transfected with a polynucleotide encoding the nGPCR-2644 amino acid sequence set forth in a sequence of SEQ ID NO:1 and that expresses the nGPCR-2644 protein having the amino acid sequence set forth in SEQ ID NO:2.

Claim 73 **(withdrawn):** A method for identifying a modulator of biological activity of nGPCR-2644 comprising the steps of:

a) contacting a cell according to claim 72 in the presence and in the absence of a putative modulator compound;

b) measuring nGPCR-2644 biological activity in the cell;

wherein decreased or increased nGPCR-2644 biological activity in the presence versus absence of the putative modulator is indicative of a modulator of biological activity.

Claim 74 **(withdrawn):** A method to identify compounds useful for the treatment of a mental disorder, said method comprising the steps of:

(a) contacting a composition comprising nGPCR-2644 with a compound suspected of binding nGPCR-2644;

(b) detecting binding between nGPCR-2644 and the compound suspected of binding nGPCR-2644;

wherein compounds identified as binding nGPCR-2644 are candidate compounds useful for the treatment of a mental disorder.

Claim 75 **(withdrawn):** A method for identifying a compound useful as a modulator of binding between nGPCR-2644 and a binding partner of nGPCR-2644 comprising the steps of:

(a) contacting the binding partner and a composition comprising nGPCR-2644 in the presence and in the absence of a putative modulator compound;

(b) detecting binding between the binding partner and nGPCR-2644;

wherein decreased or increased binding between the binding partner and nGPCR-2644 in the presence of the putative modulator, as compared to binding in the absence of the putative modulator is indicative a modulator compound useful for the treatment of a mental disorder.

Claim 76 **(withdrawn):** A method according to claim 74 or 75 wherein the composition comprises a cell expressing nGPCR-2644 on its surface.

Claim 77 **(withdrawn):** A method according to claim 76 wherein the composition comprises a cell transformed or transfected with a polynucleotide that encodes nGPCR-2644.

Claim 78 **(withdrawn):** A method of purifying a G protein from a sample containing said G protein comprising the steps of:

a) contacting said sample with a polypeptide of claim 1 for a time sufficient to allow said G protein to form a complex with said polypeptide;

b) isolating said complex from remaining components of said sample;

c) maintaining said complex under conditions which result in dissociation of said G protein from said polypeptide; and

d) isolating said G protein from said polypeptide.

Claim 79 **(withdrawn):** The method of claim 78 wherein said sample comprises an amino acid sequence of SEQ ID NO:2.

Claim 80 **(new)** The polypeptide of claim 33 wherein said wherein said amino acid sequence is at least 90% homologous to SEQ ID NO:2.

Claim 81 **(new)** The isolated polypeptide of claim 33, wherein said polypeptide is a seven transmembrane receptor.

Claim 82 **(new)** The isolated polypeptide of claim 81, wherein said seven transmembrane receptor is a G-protein coupled receptor.

Claim 83 **(new)** The isolated polypeptide of claim 30 wherein said fragment comprises at least 5 amino acids.

Claim 84 **(new)** The isolated polypeptide of claim 30 wherein said fragment comprises at least 20 amino acids.

Claim 85 **(new)** A purified and isolated polypeptide encoded by a polynucleotide comprising a nucleotide sequence wherein said polynucleotide hybridizes to the nucleotide sequence set forth in SEQ ID NO: 1 or the noncoding strand complementary thereto, under stringent hybridization conditions with the provision that the polynucleotide comprises a nucleotide sequence that differs from the sequence set forth as SEQ ID NO: 1 and from its complementary strand by at least one nucleotide.

Claim 86 **(new)** The polypeptide of claim 85, wherein said polypeptide is a seven transmembrane receptor.

Claim 87 **(new)** The polypeptide of claim 86, wherein said seven transmembrane receptor is a G-protein coupled receptor.